REMARKS

Claims 12-26 are all the claims pending in the application. Applicants thank the Examiner for indicating that claims 16 and 17 are allowed.

Incomplete Office Action/Premature Finality

As an initial matter, Applicants submit that the current Office Action is incomplete. For example, MPEP 707.07(f) states that "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it". In the previous Amendment filed June 19, 2008 (hereinafter, "the previous Amendment"), arguments with respect to claims 13-15, 18, and 25 were submitted (*see* previous Amendment, page 11, third full paragraph to page 12, first full paragraph, and page 14, last paragraph). These arguments are not addressed in the current Office Action (Office Action, pages 5, paragraph 4 continuing to page 6). Therefore, the current Office Action is incomplete.

Moreover, maintaining the rejection on a final basis, without addressing the Applicants' previously submitted arguments is prejudicial to the Applicants. Thus, Applicants submit that the finality of the Office Action is premature, and respectfully request withdrawal of the improper finality.

Claim Rejections - 35 U.S.C. § 102

Claims 12-15 and 18-26 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Yutkowitz *et al.* (U.S. Patent No. 5,710,498, "Yutkowitz"). For *at least* the following reasons, Applicants respectfully traverse the rejection.

Claims 12-15

Applicants maintain that claim 12 is not anticipated by Yutkowitz. For example, claim 12 relates to a servo controller. The servo controller comprises, *inter alia*, a position feedback correction unit for outputting a corrected position feedback signal by adding a between-axes positional deviation to a self-axis position to which a gain is applied. The between-axes positional deviation is the difference between a self-axis position and another-axis position. Moreover, the between-axes positional deviation is filtered and gained.

It was previously submitted that although Yutkowitz's position error and velocity command generator 23 determines differences between commanded positions $PCMD_I$ and measured positions $PACT_I$ (Yutkowitz, col. 9, lines 52-56), neither the commanded positions $PCMD_I$ nor the measured positions $PACT_I$ disclose or suggest the claimed between-axes positional deviation. Moreover, it was submitted that there is no disclosure in Yutkowitz of calculating, with respect to the subject **controlled element**, a difference between a self-axis position and **another-axis position**. Only the position (desired, actual, or compensated) of the controlled element itself is taken into account. A position of **another-axis** when outputting a velocity command from the gain multiplier 14 (which takes in as input the position loop error output from the junction 12) is never accounted for in Yutkowitz (previous Amendment, pages 10-11).

In response, the Examiner again relies on the same portions of Yutkowitz as cited previously for allegedly disclosing the claimed position feedback correction unit (e.g., col. 6, lines 12-28 and 36-68, and col. 9, lines 26-56). The only new assertion the Examiner makes in response to the above arguments is that "[t]his is with respect to the controlled element include movable machine members (abstract)" (Office Action, page 6, lines 9-16). That is, the Examiner

appears to be alleging that Yutkowitz discloses outputting a corrected position feedback signal with respect to multiple movable machine members (in an effort to disclose the claimed "between-axes positional deviation" which is the difference between a self-axis position and another-axis position). Applicants respectfully disagree.

For instance, the Examiner's reliance on Yutkowitz's Abstract is misplaced, and the teachings of the Abstract are being taken out of context. Although Yutkowitz discloses in its Abstract that "[c]ompensation for friction affecting motion of moveable machine members is effected in servo control of the member actuators", in the 'Summary of the Invention' section in col. 2, Yutkowitz further discloses that "[a]n actuator is controlled to move a machine member according to position commands defining positions of the member" (col. 2, lines 45-47). That is, the control in Yutkowitz is based on the positions of only the subject moveable member, and not another member (presumably on another axis as alleged by the Examiner).

To further highlight this distinction, Applicants produce below figures A and B based on Yutkowitz's disclosure, and figure C based on a non-limiting embodiment of claim 12. Figure A is a summarized version of Yutkowitz's FIG. 3b, in simplified block form. Figure B shows a more detailed version of figure A, illustrating Yutkowitz's technique of position control. Figure C, which as noted above illustrates an exemplary embodiment of the invention set forth in claim 12, shows the distinguishing features of claim 12 when compared to figures A and B which illustrate Yutkowitz's technique.

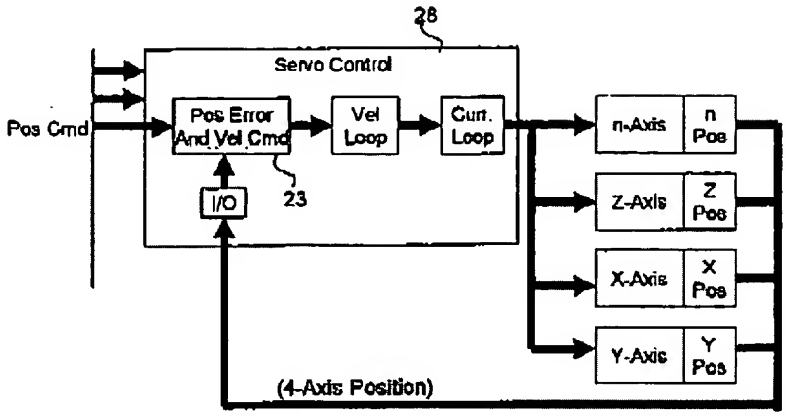

Fig.A : Fig.3b

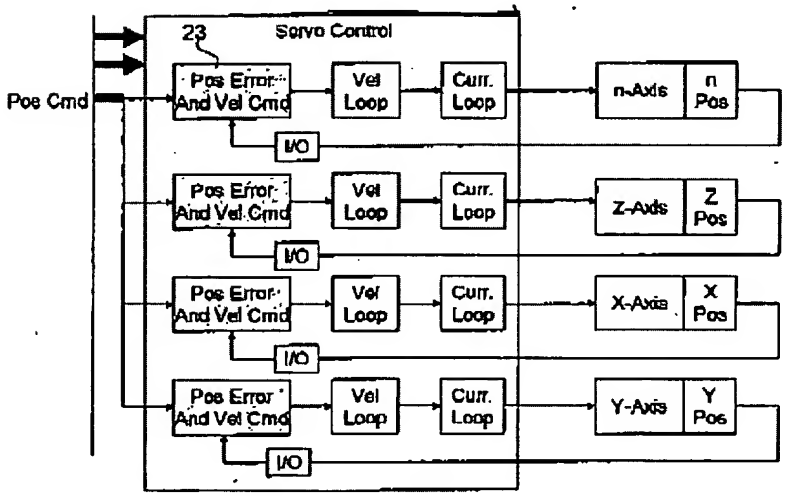

Fig.B : Implication of Fig.3b

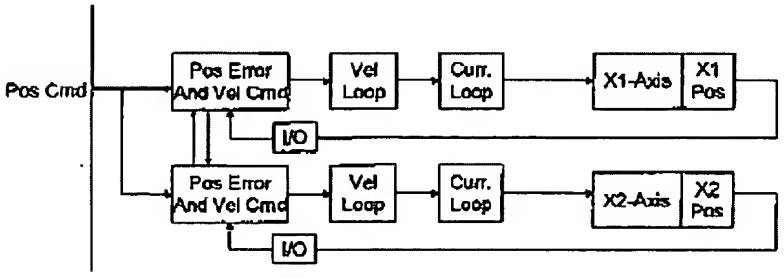

Fig.C : Example of Our Invention

As shown in figure B, each of the axes (e.g., X/Y/Z) is controlled independent of the other axes in Yutkowitz (also see Yutkowitz: col. 4, lines 53-67, and col. 9, lines 52-62).

Further, the aforementioned position error and velocity command generator 23 includes the following components from Yutkowitz's FIG. 2a - the summing junction 230, summing junction 12, block 14, and summing junction 15. As such, Yutkowitz's position correction technique takes an effect of friction into account using a positional deviation between a position command of a self-axis and a real position of the self-axis (e.g., Yutkowitz, col. 9, lines 34-46). No positional deviation between a self-axis position and another-axis position is taken into account in Yutkowitz for position correction.

Moreover, as shown in figure C, a position of another axis (e.g., the X2 axis) in addition to the subject axis (e.g., the X1 axis) is taken into account to perform position correction in the claimed invention. Yutkowitz does not anticipate this feature. In other words, Yutkowitz does not disclose the claimed position feedback correction unit for outputting a corrected position feedback signal by adding a between-axes positional deviation to a self-axis position to which a gain is applied, wherein the between-axes positional deviation is the difference between a self-axis position and another-axis position. Consequently, Yutkowitz cannot anticipate claim 12.

Claims 13-15 are patentable *at least* by virtue of their dependency. Further, as noted above, distinctions between the features recited in claims 13-15 and Yutkowitz were pointed out in the previous Amendment that **have not been addressed** in the Office Action. For the Examiner's convenience, Applicants reproduce below the previously pointed out distinctions.

For example, claim 13 recites that in the position feedback correction unit, the gain applied to the between-axes positional deviation is set at a negative value during operational stops, and is set at a positive value during operational runs. The Examiner cites col. 11, line 65 to col. 12, line 6 of Yutkowitz to disclose this feature. Applicants respectfully disagree.

In the cited portion, Yutkowitz discloses that when the current state is in a negative direction, "no command state is set if the current commanded velocity is zero..." (*see* also: col. 5, lines 33-35). The no command state corresponds to no compensation being applied to the position values, i.e., **no gain** is applied to the desired position command PCMD, let alone a **negative valued** gain as required by claim 13.

Claims 14 and 15 recite that the servo controller further comprises a velocity feedback correction unit for outputting a corrected velocity feedback signal by adding a between-axes velocity deviation, filtered and gained, that is the **difference** between the self-axis velocity and **another-axis velocity**, to a self-axis velocity to which a gain is applied. The Examiner contends that col. 9, lines 57-62 of Yutkowitz disclose this feature. Applicants respectfully disagree.

For example, in Yutkowitz, it is generally disclosed that the velocity loop control 37 determines differences between commanded velocities and actual velocities. The commanded velocities do not disclose or suggest the claimed between-axes velocity deviation, since another-axis velocity is never taken into account when calculating an estimated velocity in Yutkowitz (e.g., see col. 6, lines 36-47, "...values of estimated velocity according to a filter function operating on position commands and velocity feedforward commands may be periodically determined according to...(equation 1)"). Therefore, Yutkowitz cannot disclose the claimed velocity feedback correction unit set forth in claims 14 and 15.

Claims 18-24

Applicants maintain that claim 18 is not anticipated by Yutkowitz. For example, claim 18 relates to a servo controller. The servo controller comprises, *inter alia*, (1) a reference model control unit for calculating, based on a position command, a model position and a model

acceleration for simulating an ideal movement for a machine, (2) a position control unit for performing, according to the difference between the model position and a self-axis position, positional control to output a velocity command, and (3) a model torque correction unit for **correcting**, according to the self-axis position and **another-axis position**, **the model acceleration** to calculate a model torque.

It was pointed out in the previous Amendment that the Office action does not address *at least* features (1) and (2) of claim 18 noted above. Instead, the features of claim 12, which are not recited in claim 18, have been addressed (again) in the Office Action. In response, the Examiner contends that "although Yutkowitz does not use the same claim terminology, the claim limitations were addressed" (Office Action, page 6, lines 7-8). First, Applicant respectfully disagrees with this assertion since the rejection of claim 18 has been changed from the last Office Action to the current Office Action (e.g., compare page 3, first paragraph, lines 1-5 of last Office Action dated March 19, 2008 to page 3, first paragraph, lines 1-5 of current Office Action – the claim 18 rejection in the current Office Action has been revised to address feature (1)). Moreover, the Examiner has still not properly addressed the position control unit of claim 18. Rather, the functionality of the position control unit recited in the claim 18 rejection is simply copied from the claim 12 rejection. As pointed out above, however, these features are not recited in claim 18. The distinct recitations related to the position control unit of claim 18 are not addressed.

Accordingly, Applicants submit that the Office action is incomplete, and again request the Examiner to address all the features of every claim presented for examination

in any subsequent action (this request was made previously also, see previous Amendment, page 13, first paragraph).

In this Office Action, it appears that the Examiner is asserting with respect to the claimed model torque correction unit which **corrects**, according to the self-axis position and **another-axis position**, the model acceleration to calculate a model torque, that Yutkowitz discloses this feature because it discloses multiple movable machine members (e.g., Office Action, page 6, lines 3-7). As pointed out above with respect to claim 12, however, any control/correction in Yutkowitz is based on the positions of only a single moveable member, and not another member as set forth in col. 2, lines 31-52 of Yutkowitz.

Furthermore, Yutkowitz only discloses that its torque feed forward command (allegedly the claimed model torque) takes friction into account (Yutkowitz, col. 5, line 61 to col. 6, line 35). However, it does not disclose a model torque correction unit for correcting, according to the self-axis position and another-axis position, the model acceleration to calculate a model torque, as set forth in claim 18. In addition, the claimed invention relates to a technique in which two axes 9 (e.g., an axes tandem) are moved by a same command such as X1 and X2. On the other hand, Yutkowitz discloses a technique in which axes are moved by different commands such as XYZn. Therefore, the control operations in Yutkowitz are necessarily different from those set forth in claim 18. Accordingly, Yutkowitz cannot anticipate claim 18.

Applicants also reproduce below the previously unaddressed argument as noted above under the 'Incomplete Office Action/Finality is Premature' section (previous Amendment, page 13, third paragraph).

Applicants submit that the claimed model torque correction unit is a feedforward correction unit (e.g., the accumulator in claim 18 calculates a torque command based on the model torque calculated by the model torque correction unit and the feedback torque command). On the other hand, there is no feedforward correction of the torque command at the summing junction 240. Instead, the correction processing in Yutkowitz is based on feedback signals. Therefore, claim 18 is patentable over Yutkowitz.

To further emphasize the distinctions between the claims and Yutkowitz, Applicants produce below a comparison table for the Examiner's convenience:

Comparison table between Yutkowitz and claims

	Yutkowitz	Claims (e.g., claims 12 and 18)
Control object	Orthogonal axes (e.g., XYZ) control.	Tandem axes (e.g., X1/X2) control, where X1 and X2 move in same axes direction.
Feedback correction by between-axes positional deviation	None - position correction corresponds to correction of friction effect, and positional deviation corresponds to deviation between a position command of a self-axis and real position of the self-axis.	Yes - position deviation between a self-axis position and the other-axis position is fed back.
Torque feed-forward	Yes, but taking only friction into account.	Yes, taking an effect of another-axis into account.

In view of the above, withdrawal of the 35 U.S.C. § 102(b) rejection is respectfully requested.

Claims 19-24 are patentable *at least* by virtue of their dependency.

Claims 25 and 26

Applicants maintain that claim 25 is not anticipated by Yutkowitz. For example, claim 25 relates to a servo controller. The servo controller comprises, *inter alia*, (1) a reference model control unit for calculating, based on a position command, a model position and a model acceleration for simulating an ideal movement for a machine, (2) a position feedback correction unit for outputting a corrected position feedback signal based on a self-axis position and **another-axis position**, (3) a position control unit for performing, according to a **difference** between the model position and **the corrected position feedback signal** outputted from the position feedback correction unit, positional control to output a velocity command, (4) a velocity feedback correction unit for outputting a corrected velocity feedback signal based on a self-axis velocity and **another axis-velocity**, and (5) a model torque correction unit for **correcting**, according to another-axis model acceleration, the self-axis position, **and the other-axis position**, the model acceleration, to calculate a model torque.

Since feature (5) is similar to the one discussed above with respect to claim 18, Applicants respectfully submit that claim 25 is patentable for *at least* reasons given above with respect to claim 18. Further, as submitted earlier with respect to claims 12 and 18, Yutkowitz does not disclose or suggest taking into account any other-axis value (see above-noted features 2 and 4 of claim 25) when calculating the compensated position/velocity values or the positional errors. Rather, any control/correction in Yutkowitz is based on the positions of only a single moveable member, and not another member as set forth in col. 2, lines 31-52 of Yutkowitz. Accordingly, claim 25 is also patentable for *at least* reasons given above with respect to claim 12.

In addition, as pointed out above, the Examiner does not address the previously submitted argument with respect to claim 25 on page 14, last paragraph of the previous Amendment. For Examiner's convenience, the argument is reproduced below.

Claim 25 recites a position control unit for performing, according to a **difference** between the model position and **the corrected position feedback signal** outputted from the position feedback correction unit, positional control to output a velocity command. Yutkowitz, however, does not disclose any **corrected** position feedback signal, much less a **difference** between the compensated position value (allegedly the model position) and the **corrected** position feedback signal. Rather, the positional difference in Yutkowitz is between the compensated position value and an **actual** position of the controlled element at junction 12 (FIG. 2a, col. 6, lines 25-29, and col. 9, lines 53-56). Yutkowitz does not disclose that this actual position is **corrected** at the time the difference between the actual position and the compensated position value is calculated at the junction 12.

Therefore, claim 25 is patentable over Yutkowitz, and thus, withdrawal of the 35 U.S.C. § 102(b) rejection is respectfully requested.

Claim 26 is patentable *at least* by virtue of its dependency.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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